CLAIMS

What is claimed is:

1. A digital adaptive equalizer for a data communication path, comprising:

a first programmable filter capable of being programmed to implement any of a plurality of filter transfer functions;

a filter selector to select any one of said plurality of filter transfer functions for said first programmable filter; and

a second digital filter receiving an output from said first programmable filter.

2. The digital adaptive equalizer for a data communication path according to claim 1, wherein said first digital filter comprises:

an infinite impulse response filter.

3. The digital adaptive equalizer for a data communication path according to claim 1, wherein said second digital filter comprises:

a finite impulse response filter.

4. The digital adaptive equalizer for a data communication path according to claim 1, wherein:

said second digital filter adapts a transfer function to best fit an input data signal.

5. The digital adaptive equalizer for a data communication path according to claim 4, wherein:

said transfer function is adapted based on a least mean square algorithm.

6. The digital adaptive equalizer for a data communication path according to claim 1, wherein said data communication path comprises one of:

a T1 communication path; and

an E1 communication path.

7. The digital adaptive equalizer for a data communication path according to claim 6, wherein:

said data communication path is formed by a twisted pair.

8. The digital adaptive equalizer for a data communication path according to claim 6, wherein:

said data communication path is formed by a coaxial cable.

9. The digital adaptive equalizer for a data communication path according to claim 6, wherein:

said data communication path is formed by a wireless RF medium.

10. The digital adaptive equalizer for a data communication path according to claim 1, further comprising:

an analog-to-digital converter to digitize a received substantially raw T1/E1 signal for input to said digital adaptive equalizer.

11. The digital adaptive equalizer for a data communication path according to claim 1, wherein:

said plurality of transfer functions in said first digital filter are formed by a selection of any of at least four sets of coefficients available to said first digital filter.

12. The digital adaptive equalizer for a data communication path according to claim 11, wherein:

one of said at least four sets of coefficients is selected based on a determination of a least amount of error in a received data signal.

13. The digital adaptive equalizer for a data communication path according to claim 11, wherein:

an initial value of said at least four sets of coefficients is set to an autocorrelation function of an amplitude mark inversion, return to zero signal.

14. A method of digitally equalizing a received T1/E1 data signal, comprising:

firstly filtering said received T1/E1 data signal using a first digital filter; and

adaptively adjusting an output of said first digital filter to accurately match an inverse response of a transmission channel used to transmit said received T1/E1 data signal.

15. The method of digitally equalizing a received T1/E1 data signal according to claim 14, further comprising:

detecting a periodic pattern in said received T1/E1 data signal.

16. The method of digitally equalizing a received T1/E1 data signal according to claim 15, further comprising:

freezing said adaptive adjustment when a periodic pattern is detected.

17. The method of digitally equalizing a received T1/E1 data signal according to claim 14, wherein:

said firstly filtering performs an infinite impulse response filter transfer function.

18. The method of digitally equalizing a received T1/E1 data signal according to claim 14, wherein:

said adaptively adjusting step selects and implements one of a plurality of transfer function coefficients available for said digital filter.

19. The method of digitally equalizing a received T1/E1 data signal according to claim 18, wherein:

an initial value of said plurality of transfer function coefficients is set to an autocorrelation function of an amplitude mark inversion, return to zero signal.

20. The method of digitally equalizing a received T1/E1 data signal according to claim 14, further comprising:

secondly filtering said firstly filtered received T1/E1 data signal.

21. The method of digitally equalizing a received T1/E1 data signal according to claim 14, wherein:

said secondly filtering performs a finite impulse response transfer function on said firstly filtered received T1/E1 data signal.

22. The method of digitally equalizing a received T1/E1 data signal according to claim 20, further comprising:

adaptively adjusting coefficients for said finite impulse response transfer function on a basis of a best fit algorithm.

23. The method of digitally equalizing a received T1/E1 data signal according to claim 22, wherein:

said best fit algorithm is a least mean square algorithm.

24. Apparatus for digitally equalizing a received T1/E1 data signal according to claim 23, comprising:

means for firstly filtering said received T1/E1 data signal using a first digital filter; and

means for adaptively adjusting an output of said first digital filter to accurately match an inverse response of a transmission channel used to transmit said received T1/E1 data signal.

25. The apparatus for digitally equalizing a received T1/E1 data signal according to claim 24, wherein:

said firstly filtering performs an infinite impulse response filter transfer function.

26. The apparatus for digitally equalizing a received T1/E1 data signal according to claim 24, wherein:

said means for adaptively adjusting selects and implements one of a plurality of transfer function coefficients available for said digital filter.

27. The apparatus for digitally equalizing a received T1/E1 data signal according to claim 24, further comprising:

means for secondly filtering said firstly filtered received T1/E1 data signal.

28. The apparatus for digitally equalizing a received T1/E1 data signal according to claim 24, wherein said means for secondly filtering comprises:

a finite impulse response transfer function on said firstly filtered received T1/E1 data signal.

29. The apparatus for digitally equalizing a received T1/E1 data signal according to claim 28, further comprising:

means for adaptively adjusting coefficients for said finite impulse response transfer function on a basis of a best fit algorithm.

30. The apparatus for digitally equalizing a received T1/E1 data signal according to claim 29, wherein:

said best fit algorithm is a least mean square algorithm.